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EXAMINER	
DRENNAN, BARRY T	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,021	STOFFER ET AL.	
	Examiner	Art Unit	
	Barry Drennan	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed 7 July 2009 has been entered in full. Accordingly, claims 1-15 are pending in the application.

Response to Arguments

2. Applicant has amended the title of the application in response to the objection to the specification as having an insufficiently descriptive title. The new title is satisfactory. Accordingly, the objection to the specification on this basis is withdrawn.

3. Applicant has amended the specification in response to the objections to the specification for including a hyperlink in the text. Accordingly, the objection to the specification on this basis is withdrawn.

4. Applicant has amended claim 1 in response to the rejection of claim 1 under 35 U.S.C. 112, second paragraph, as being indefinite. Accordingly, the rejection of claim 1 on this basis is withdrawn.

5. Applicant has argued, in response to the rejections of claims 1-13 under 35 U.S.C. 101 as being directed to nonstatutory subject matter, that the claims are, in fact, directed to statutory subject matter. In particular, Applicant relies on the holding of *In re*

Abele (684 F.2d 902, 214 USPQ 682 (CCPA 1982)), which was favorably discussed in *In re Bilski* (545 F.3d 943, 88 USPQ2d 1385 (Fed. Cir. 2008)), as indicating that the claims recite an eligible transformation.

Examiner respectfully disagrees. As *Abele* requires, the data being modified must be representative of a physical object or substance. None of claims 1-15 recite any indication of what the subject matter of the images is, how those images are obtained, etc. The images could be, for example, completely computer-generated, or they could contain nothing but random noise. Neither of these types of images would be representative of a physical object or substance.

As *Abele* further requires, there must be a claimed depiction of the modified data as an external representation of the aforementioned physical object or substance, and the depiction must impose meaningful limitations on the claim scope and not be mere extra-solution activity. In the present claims, no such depiction is recited.

In view of the foregoing, claims 1-15 do not recite an eligible transformation. However, after further consideration, Examiner believes that claims 8-13 recite claim elements which require the use of a particular apparatus (a storage device, for claims 8-10, or a communications device, for claims 11-13). Therefore, claims 8-13 are tied to a machine, per *Bilski*, and are statutory.

Accordingly, the rejections of claims 1-7 under 35 U.S.C. 101 are maintained, and the rejections of claims 8-13 under 35 U.S.C. 101 are withdrawn.

6. Applicant has argued, in response to the rejections of claims 1 and 14 under 35 U.S.C. 103(a) as being obvious over Thompson in view of Girod for claim 1, and Thompson in view of Girod and Cohen[1] for claim 14, that the combination of Thompson and Girod does not teach all of the limitations of claims 1 (and, likewise, the similar limitations of claim 14).

In particular, Applicant argues that since Thompson teaches subtractive compression between adjacent pixels of the same frame, Thompson does not teach the limitations of the present claims, and furthermore, that Girod does not remedy the deficiencies of Thompson.

While Examiner agrees, as set forth in the prior Office action, that Thompson does not teach all elements of the claim, this is why Girod was introduced into the rejection. Applicant's assertion that the description of Girod's technique as a "predictive methodology" places it outside the scope of the present claims is insufficient to overcome the rejection, because nothing in the claim precludes the inclusion of such methodology in the combination of references cited in rejecting the claim.

Furthermore, Applicant's explanation of the differences between the intraframe coding of Thompson – where pixels are subtracted from adjacent pixels because the values of those pixels are statistically likely to be similar to the adjacent pixels – and the interframe coding of Girod – where pixels are subtracted from *temporally* adjacent pixels because the values of those pixels are statistically likely to be similar to the temporally adjacent pixels, i.e., pixels at the same location but in an adjacent frame – tends to

[1] A full citation of these references is provided in the statement of pending rejections below.

support Examiner's argument that the interframe teachings of Girod, as applied to the invention of Thompson, would result in a combination which teaches the present claims.

Essentially, the combination involves modifying the invention of Thompson by converting it into an interframe compressor (although the original intraframe coding could be performed as well). As Girod teaches, interframe coding simply requires subtracting the value of a pixel from the value of the temporally adjacent pixel (i.e., at the same location but from the adjacent frame), and an ordinary artisan could easily have made that modification (to subtract from the value of the temporally adjacent pixel, rather than a spatially adjacent pixel) in view of the invention of Thompson and the teachings of Girod. The result of this combination teaches all of the limitations of the present claims.

In particular, as Girod teaches, the interframe technique is predicated upon the input being presented in a particular temporal order, indicating that the images are arranged in an ordered series from 1 to n; Thompson teaches the subtraction of a pixel from a corresponding spatially adjacent pixel, and Girod teaches subtracting it from a corresponding temporally adjacent pixel; Thompson teaches quantization, which adjusts the pixel value to zero for the pixels of the subtracted images below a predetermined threshold; and Thompson teaches compressing the subtracted images.

Accordingly, the rejections of claim 1 under 35 U.S.C. 103(a) over Thompson in view of Girod, and claim 14 under 35 U.S.C. 103(a) over Thompson in view of Girod and Cohen, are maintained.

7. Applicant has argued that claims 2-13 are allowable by virtue of being dependent from an allowable claim. This argument is moot in view of the foregoing discussion.

8. Applicant has argued that claim 15 has substantially similar limitations to those in claim 2, which Applicant had argued was allowable by virtue of being dependent from an allowable claim, and that claim 15 was therefore also allowable. This argument is moot in view of the foregoing discussion.

9. No new grounds of rejection are presented in this Office action. Accordingly, this action is made final.

10. Following is a statement of all objections and rejections pending in the application.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. ***Claims 1-7*** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims are directed to a method, but the method is not adequately tied to a particular apparatus, nor does the claim recite an eligible transformation, as discussed above and in the prior Office action.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. ***Claims 1-3 and 6*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson, J.E., U.S. Patent 3,921,204 (issued 18 November 1975, hereinafter **Thompson**), and further in view of Girod, B., et al., "A subjective evalutation of noise-shaping quantization for adaptive intra-/interframe DPCM coding of color television signals," IEEE Transactions on Communications, vol. 36 issue 3, pp. 332-346 (published March 1988, hereinafter **Girod**).

15. With respect to **claim 1**, Thompson discloses:

subtracting the value of each pixel of the ordered image a corresponding pixel to form subtracted images (**Fig. 1 #2**);

adjusting pixel values to zero when the subtracted image pixel value is below a threshold (**Fig. 1 #3 and Fig. 2**); and

compressing the image series [comprising the subtracted images] using a compression algorithm to form compressed images (**Fig. 1 #4**).

Thompson does not disclose arranging the images in order or having the subtraction take place between a pixel and the corresponding pixel in an adjacent image (i.e., interframe coding versus Thompson's intraframe coding).

However, Girod discloses a similar system (**Fig. 1**) including interframe coding (**Fig. 2a**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image compression system of Thompson by replacing the intraframe sampling with the interframe sampling of Girod, motivated by the fact that this system will prove beneficial "[i]n regions of the picture where the signal contains only small changes from frame to frame" (**Girod p. 332 col. 2, fifth full paragraph**).

16. With respect to **claim 2**, Thompson further discloses decompressing the images compressed according to the technique of Thompson and Girod, above, by reconstructing the decompressed images (**Fig. 1 #8**) and re-adding the subtracted pixel values to the previous sample (**Fig. 1 #9, #11**) to arrive at the original images modulo the lossy operations (e.g., thresholding, lossy compression) earlier performed.

17. With respect to **claim 3**, Thompson further discloses that the adjacent images are reconstructed images (**reconstruction occurs at Fig. 1 #5, and those images are then subtracted at Fig. 1 #2**).

18. With respect to **claim 6**, Thompson and Girod disclose the limitations of parent claim 1, but Thompson does not disclose the images being aligned.

However, Girod implicitly discloses the alignment of the images because this is an integral part of an interframe coding technique, as suggested in Fig. 2.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image compression system of Thompson and Girod by replacing the intraframe sampling with the interframe sampling of Girod, which requires the alignment of the images, motivated by the fact that this system will prove beneficial "[i]n regions of the picture where the signal contains only small changes from frame to frame" (**Girod p. 332 col. 2, fifth full paragraph**).

19. ***Claims 4 and 5*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson and Girod as applied to claim 1 above, and further in view of Kwon, H., U.S. Patent 4,745,465 (issued 17 May 1988, hereinafter **Kwon**).

20. With respect to **claim 4**, Thompson and Girod disclose the limitations of parent claim 1, including the threshold zeroing of Thompson. Thompson and Girod do not disclose adjusting the threshold such that the threshold value is less than a noise tolerance threshold for the subtracted pixels.

However, Kwon discloses selecting a threshold such that "most of the noisy uniform area and fine textured area are rejected" (**col. 7 lines 19-21**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the threshold zeroing subtractive compressor of Thompson and Girod with the noise-detecting threshold adjustment of Kwon,

because doing so would ensure that regions containing noise would be rejected while regions containing scene content would be maintained (**Kwon, col. 7 lines 22-26**).

21. With respect to **claim 5**, Thompson, Girod, and Kwon disclose the limitations of parent claim 4. Thompson and Girod do not disclose setting the threshold to the maximum value in which a normal distribution test is passed.

However, Kwon discloses using a chi-squared test to determine whether the signal has a Gaussian (i.e., normal) distribution and setting the threshold accordingly (**col. 7 lines 15-22**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the threshold zeroing subtractive compressor of Thompson and Girod with the chi-squared test noise-detecting threshold adjustment of Kwon, because doing so would ensure that regions containing noise would be rejected while regions containing scene content would be maintained (**Kwon, col. 7 lines 22-26**).

22. ***Claim 7*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson and Girod as applied to claim 1 above, and further in view of Ransford et al., U.S. Patent 5,490,221 (issued 6 February 1996, hereinafter **Ransford**).

23. With respect to **claim 7**, Thompson and Girod disclose the limitations of parent claim 1, but do not disclose the application of a noise reduction filter to any of the images.

However, Ransford discloses a differential compression method that also applies a noise filter to the images (**Fig. 2 #55**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the differential interframe image compression technique of Thompson and Girod with the region smoothing filter of Ransford, motivated by the ability to reduce noise in the differential images (**Ransford, col. 13 lines 49-53**), particularly in areas missed by the thresholding filter, as well as the need to apply some sort of filtering to the initial image which is not noise-filtered by the thresholding process.

24. ***Claims 8 and 10-13*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson and Girod as applied to claim 1 above, and further in view of Cohen, M.S., "A data compression method for image time series," Human Brain Mapping, vol. 12 issue 1, pp. 20-24 (published January 2001, hereinafter **Cohen**).

25. With respect to **claim 8**, Thompson and Girod disclose the limitations of parent claim 1, but do not disclose storage of the images.

However, Cohen discloses a differential image compression technique as well as the transfer of said images via FTP (**section III, second paragraph**), thus inherently storing the images both at the source and destination location. The storage format inherent to Cohen is the disk storage format utilized by the computers used by Cohen.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store, as disclosed by Cohen, the images encoded by

the technique of Thompson and Girod, motivated by the well-known need to access images at a different time than when they were produced, compressed, etc.

26. With respect to **claim 10**, Thompson, Girod, and Cohen disclose the limitations of parent claim 8, but neither Thompson nor Girod disclose storage of the images.

However, Cohen implicitly discloses storage in RAM, cache, a fixed disk, and/or a magnetic disk as part of using FTP to transfer the images (**section III, second paragraph**) in conjunction with the computer systems described in section II.C.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store, as disclosed by Cohen, the images encoded by the technique of Thompson and Girod, motivated by the well-known need to access images at a different time than when they were produced, compressed, etc.

27. With respect to **claims 11-13**, Thompson and Girod disclose the limitations of parent claim 1, and both disclose the transmission of the compressed images. Neither explicitly discloses encoding in a transmission format and transmitting through a particular medium.

However, Cohen discloses transferring the compressed images via FTP, where the transmission format is TCP/IP and the transmission mechanism is a network (likely the Internet) (**section III, second paragraph**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to transmit, as disclosed by Cohen, the images encoded

by the technique of Thompson and Girod, motivated by the well-known need to access images at a different place than where they were produced, compressed, etc.

28. ***Claim 9*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson, Girod, and Cohen as applied to claim 8 above, and further in view of Boutell, T., et al., "PNG (Portable Network Graphics) Specification Version 1.0," RFC 2083 (published March 1997, hereinafter **RFC 2083**).

29. With respect to **claim 9**, Thompson, Girod, and Cohen disclose the limitations of parent claim 8, but none discloses encoding the image in the PNG format.

However, RFC 2083 discloses the PNG format as an image format providing lossless image compression.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to store the differential images produced by the technique of Thompson, Girod, and Cohen, in the PNG format disclosed in RFC 2083, motivated by the features provided by PNG (**"PNG is robust, providing both full file integrity checking and simple detection of common transmission errors," or "Sample depths range from 1 to 16 bits," RFC 2083, page 1**).

30. ***Claims 14 and 15*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson, and further in view of Girod and Cohen.

31. With respect to **claim 14**, Thompson discloses:

subtracting the value of each pixel of the ordered image a corresponding pixel to form subtracted images (**Fig. 1 #2**);

adjusting pixel values to zero when the subtracted image pixel value is below a threshold (**Fig. 1 #3 and Fig. 2**); and

compressing the image series [comprising the subtracted images] using a compression algorithm to form compressed images (**Fig. 1 #4**).

Thompson does not disclose arranging the images in order or having the subtraction take place between a pixel and the corresponding pixel in an adjacent image (i.e., interframe coding versus Thompson's intraframe coding).

However, Girod discloses a similar system (**Fig. 1**) including interframe coding (**Fig. 2a**). Furthermore, Cohen discloses implementing a similar system (**Sec. II.A.**) on a computer (**Sec. II.C.**) which inherently includes a processor and memory.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image compression system of Thompson by replacing the intraframe sampling with the interframe sampling of Girod, motivated by the fact that this system will prove beneficial "[i]n regions of the picture where the signal contains only small changes from frame to frame" (**Girod p. 332 col. 2, fifth full paragraph**), and implementing the technique on a computer such as that disclosed by Cohen, motivated by the well-known usefulness of implementing computationally-intensive techniques on a computer.

32. With respect to **claim 15**, Thompson discloses reconstructing the compressed images using an associated decompression algorithm (**Fig. 1 #8**) and adding the differential image pixels to the adjacent image (**Fig. 1 #9, #11**) to arrive at the original images modulo the lossy operations (e.g., thresholding, lossy compression) earlier performed.

Thompson does not disclose decompressing images that were compressed by arranging the images in order or having the subtraction take place between a pixel and the corresponding pixel in an adjacent image (i.e., interframe coding versus Thompson's intraframe coding).

However, Girod discloses a similar system (**Fig. 1**) including interframe coding (**Fig. 2a**). Furthermore, Cohen discloses implementing a similar system (**Sec. II.A.**) on a computer (**Sec. II.C.**) which inherently includes a processor and memory.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the image decompression system of Thompson by replacing the intraframe sampling with the interframe sampling of Girod, motivated by the fact that this system will prove beneficial "[i]n regions of the picture where the signal contains only small changes from frame to frame" (**Girod p. 332 col. 2, fifth full paragraph**), and implementing the technique on a computer such as that disclosed by Cohen, motivated by the well-known usefulness of implementing computationally-intensive techniques on a computer.

Conclusion

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry Drennan whose telephone number is 571-270-7262. The examiner can normally be reached on Monday through Thursday, 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Barry Drennan/
Examiner, Art Unit 2624

/Brian P. Werner/
Supervisory Patent Examiner, Art Unit 2624